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SEPTEMBER 3, 1949

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

A-Bomb Fireball

See Page 147

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Biology Editor Dies

➤ DR. FRANK THONE, 58, Science Service biology editor and a well-known science reporter for the past quarter of a century, died unexpectedly in Washington on Aug. 25. Death was due to coronary occlusion.

A plant ecologist, he joined the staff of Science Service in 1924 after a brief career as college professor. As a science writer, Dr. Thone specialized in biological fields but covered a wide variety of important stories in science. He covered the famed Scopes trial at Dayton, Tenn., the evolution or "monkey" trial, in the summer of 1925, and more than two decades later was a correspondent at the atomic bomb tests at Bikini.

He was best known to many readers for his columns on nature which were widely read in many newspapers and the SCIENCE NEWS LETTER. Another regular newspaper feature which he authored was a weekly story on new patents.

In 1946, Dr. Thone was one of 13 recipients of George Westinghouse distinguished science writing awards.

Born in Davenport, Iowa, April 12, 1891, Frank E. A. Thone attended public school in Des Moines, Iowa, and graduated from Grinnell College in 1915. He served as a second lieutenant in the U. S. Army during the first World War and continued his education after the war at the University of California, Johns Hopkins University and the University of Chicago where he received his Ph.D. in 1922. He taught at North Dakota State College and the University of Florida before joining the staff of Science Service.

Dr. Thone served as a naturalist at Yellowstone National Park for two summers and was the author of TREES AND FLOWERS OF YELLOWSTONE NATIONAL PARK (J. E. Haynes, 1923). He also wrote THE MICROSCOPIC WORLD (J. Messner, 1940).

A member of many scientific organizations, Dr. Thone was active in the affairs of the American Association for the Advancement of Science, the Washington Academy of Sciences and the National Association of Science Writers. He was a member of Sigma Xi, Phi Beta Kappa, Botanical Society of America, American Society of Plant Physiologists, American Society of Mammalogists, Seismological Society of America, The Wildlife Society, National Parks Association, Biological Society of Washington, Botanical Society of Washington, Wild Flower Preservation Society, Overseas Writers, Outdoor Writers Association, Catholic Commission on Intellectual and Cultural Affairs and the Cosmos Club.

Dr. Thone is survived by his mother, Mrs. Mary Anna Thone, and a sister, Margaret Thone, both of Des Moines.

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DR. FRANK THONE

MEDICINE

Mice Exposing Man's Ills

➤ FROM mice whose heritage can be traced back more generations than any human being, there may come the living materials with which scientists will solve problems in human behavior, mental illnesses and chronic and degenerative diseases, Dr. W. E. Heston of the National Cancer Institute, Bethesda, Md., told the twentieth anniversary meeting of the Roscoe B. Jackson Memorial Laboratory in Bar Harbor, Maine.

One of the greatest hopes for attacking medical problems of the future lies in the development of kinds of mice that inherit many other diseases just as some lines of mice hand down cancer to their progeny in as high as 98% of the animals.

To get even more information about cancer, many more inbred strains of mice susceptible to various kinds of disease are needed, and Dr. Heston urged greater effort to create them by breeding.

Other animals are likely to give scientists new information about the diseases of fighting and aggression which, among human beings, cause so much trouble in the world and threaten to precipitate world war. Jackson Laboratory is developing a particularly ferocious and aggressive kind of rabbit which will snap at anything that is poked into its cage. Most rabbits, like most people, are relatively peaceful and harmless.

From experiments on ferocious rabbits and their kind, it will be possible, scientists believe, to learn more about fundamental reasons why other animals, including man, fight and perhaps even go to war.

The thousands of mice which are reared and studied at Jackson Laboratory are in general not aggressive creatures. Due to the fact that they multiply much faster than even the proverbial rabbits, their speedy reproduction aids study of kinds of diseases that can be genetically concentrated in them.

If mice can be found that have the crippled joints of arthritis or the damaged hearts of cardiac victims, they can then be used to test suggested treatments for these chronic diseases or to explore into their cause.

Some Bar Harbor mice are being tested for their reaction to insulin and electric shock as a step toward an experimental study for this method of treating some forms of mental illness in human beings.

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ASTRONOMY

Adopt "New Look" in Domes for New Telescopes

➤ THE "new look" in domes has come to the student observatory at the University of Denver's Chamberlin Observatory.

After 58 years with a single-slit dome, the observatory has received a new, wider aperture to accommodate three new telescopes donated by two Denver men.

The new equipment—a 12-inch Newtonian reflecting telescope, an eight-inch Schmidt-type telescopic camera and an eight-inch Cassegrainian reflecting telescope—will replace the six-inch refractor 'scope mounted in 1891 by the observatory's first director, the late Dean Herbert A. Howe.

The present director, Dr. Albert W. Recht, said the new equipment will be used to supplement the main observatory's 20-inch refractor telescope and would be used, specifically, to "catch up" on asteroid and comet observations which had to be neglected during the war.

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CHEMISTRY-BOTANY

Salt in Water Will Kill Weeds in Beet Fields

➤ THERE'S no need to use some of the potent new chemicals with complicated names if you want to kill many of the weeds found in beet fields.

Experiments at the New York State Agricultural Experiment Station show that many of the common weeds can be destroyed with a spray containing 200 pounds of salt in 100 gallons of water.

Science News Letter, September 3, 1949

CHEMISTRY

Sources for Creating Food

Future nourishment for a hungry world may come from yeasts, seaweed, algae and wood. Scientists all over the world are working to make this practical.

➤ FOR the future populations of the world, that otherwise may be hungry, let them eat yeasts, seaweed, and algae and wood.

The dining rooms of the United Nations do not feature such unusual foods today nor will they in the near future. But the UN Conference on Conservation and Utilization of Resources meeting in Lake Success, N. Y., discussed just how soon and by what methods such "creatable resources" can be turned to practical use.

A most promising discovery is that a special microorganism, called *Rhodotorula gracilis* or more simply fat yeast, produces in its cells a substance that is 50% to 60% fat. Because fat is one of the foods in shortest supply, this is exciting practical-minded technologists. The kinds of fatty acids in the yeast fat are rather close to palm oil fat. The yeast fat also contains some of the vitamin B complex and the stuff from which vitamins A and D are made. A hundred pounds of sugar fed to this yeast produces 16.5 pounds of fat, as well as a quarter that amount of protein. The sugar used can be in molasses of lowest grade.

A report by Dr. Harry Lundin of Sweden's Royal Institute of Technology, Stockholm, shows that the dry matter in fat yeast costs about 13 cents a pound and that a desirable mixture of fat and protein should be manufactured by a practical continuous process. First the yeast is allowed to grow for 10 hours with a moderate amount of fat in its cells. Then it is put through a fattening phase for two days when it converts the sugar to fat at a great rate.

Britain turned to yeast for possible cattle feeding when a Nazi blockade threatened in 1940 just as the hard-pressed Kaiser's government in 1915 studied yeast manufacture from inorganic nitrogen. This was revealed by Dr. A. C. Thaysen, who reported from Britain's Colonial Microbiological Research Institute at Trinidad. Since 1944 there has been in Jamaica a successful food yeast factory, producing material suitable for human consumption.

The yeast itself can be fed on sugar made from wood, Dr. J. A. Hall of the U. S. Forest Service at Portland, Ore., reported. Or molasses made from wood can be fed directly to livestock, as shown in many U. S. agricultural college tests.

As for seaweed, used for centuries as laver bread fried for breakfast in the case of the reddish or sea lettuce sort in Scotland, Dr. F. N. Woodward, director of the Scottish Seaweed Research Association, predicted that the greatest use of marine algae will be in providing raw chemical materials, including alginic acid now used in food, drugs, cosmetics and textiles, and newer chemicals called mannitol, laminarin and fuccidin, that correspond roughly to the sugar and starch of land plants.

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BIOCHEMISTRY

Substance in Potatoes May Aid Body Use Proteins

➤ POTATOES may contain mysterious substances which help the body make better use of proteins.

This discovery was reported to the First International Congress of Biochemistry in Cambridge, England, by two British scientists, Dame Harriette Chick and Dr. E. B. Slack.

Young rats doubled their growth rate when the non-protein nitrogenous potato substances were substituted for one-fourth of the wheat protein in their diet. The researchers said that this cannot be explained on the basis of supplying essential amino acids, building blocks of protein. They believe some unknown mechanism is involved.

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On This Week's Cover

➤ "FIREBALL and shockwave of an atomic bomb explosion, during the tests held at Eniwetok," is the terse official statement from the Atomic Energy Commission which has just released a series of pictures taken of the atomic bomb bursts in the Pacific.

The bombs worked, and the tests yielded the required information, Lieut. Gen. John E. Hall, commander of the Joint Task Force Seven, stated at the conclusion of the tests held in April and May, 1948.

It was pointed out that these tests were not to be confused with the Bikini tests which were made to find the effects of atomic explosions on naval materiel and equipment as well as on animal and marine life. The purpose of this second series of tests was to find answers to questions on the military applications of atomic energy.

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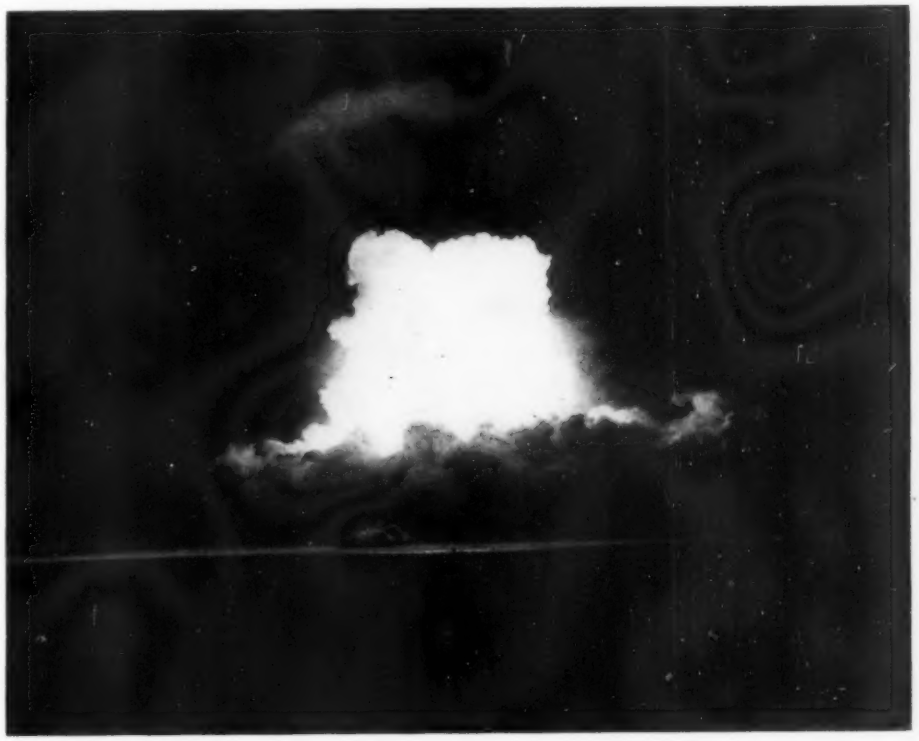

TESTING THE ATOM BOMB AT ENIWETOK—This is one in a series of pictures showing the successful explosion of an atom bomb in tests made in April and May, 1948, in the Pacific, which have just been released by the Atomic Energy Commission. Official comment, beyond expressing satisfaction with the results of the test, is confined to designating it as a "burst of an atom bomb during the experimental tests at Eniwetok."

MEDICINE

Pregnancy Illness Relief

➤ RELIEF from the nausea and vomiting which afflict one-fourth to one-half of expectant mothers may be had through daily doses of the new anti-seasickness remedy, Dramamine, scientists at Johns Hopkins University and Hospital in Baltimore are finding.

Complete relief of symptoms three hours after taking the drug was experienced by 31 of 43 women, Drs. Paul E. Carliner, H. Melvin Radman and Leslie N. Gay reported in the journal, SCIENCE (Aug. 26).

These 43 women had suffered nausea and vomiting for four to six weeks. A number of remedies, including some of the B vitamins, sedative drugs and psychiatric treatment, had failed to relieve their symptoms.

Substitute pills of milk sugar (lactose) that looked just like the Dramamine pills were given to 10 women, without their knowing the change had been made. Dramamine had controlled their symptoms, but when they got the substitute pills they relapsed. They regained their normal health after Dramamine was given again.

The drug failed to give relief to 12 of the 43 women.

Although nausea and vomiting may affect as many as half of all expectant mothers, the severity varies. Frequently it is necessary for the patients to be taken to a hospital for treatment because of the dehydration, or loss of water, that occurs. The cause of the condition has never been established. Occasionally, about once in 15,000 pregnancies, the condition is so severe that it is necessary to stop the pregnancy to save the mother.

The results with Dramamine in this condition are so encouraging that an extensive comparative study is being made at the Johns Hopkins Hospital. Dramamine was developed by scientists at G. D. Searle and Co. of Chicago as a possible remedy for hayfever and other allergies. Its value in stopping car sickness, accidentally discovered through the experience of an allergy patient at the Johns Hopkins allergy clinic, led to its trial, with successful results, as a remedy for other forms of motion sickness, including seasickness and airsickness.

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ICHTHYOLOGY

Fish Can Feed Millions In Warm Parts of Earth

➤ FISH can feed the millions of growing population in the warm parts of the earth, a leading Indian zoologist stated at the United Nations Scientific Conference on the Conservation and Utilization of Resources at Lake Success, N. Y. Almost any little body of water can be made to produce food at less cost and with a yield much higher than can be obtained from dry land farming.

Dr. Sunder Lal Hora, who is director of India's Zoological Survey at Calcutta, recommended that other countries follow the example of China, India and other Asiatic nations in raising fish for food, often in the same fields that rice is grown.

Not only do fish produce food for the table but they control the disease of malaria by feeding on the larvae of these insects.

A great advantage of fish farming is that it utilizes materials of the soil and added waste material without competing with ordinary farming.

Often two species of fish eating different kinds of food can be grown in the same pond, making the water do double duty.

Little capital is needed to start fish farming, Dr. Hora said, and pond culture promotes a happy village life as well as furnishing needed addition of protective food to the diet.

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Wild burros are the worst threat to the vegetation and water supplies in some western national parks.

The *fishing industry*, one of America's oldest, is composed of about 4,000 shore establishments, 8,000 vessels of five tons or more, and 73,000 smaller fishing craft.

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NUCLEAR PHYSICS

Russian Atom Scientist

If the Soviets have an atomic bomb, it now seems certain it was not built by the world-famous Dr. Kapitza. He has been relegated to the Communist dog-house.

➤ IF Russia has the atomic bomb or is close to achieving it, it is not because of the work of the world-famous Dr. Peter Leonidovich Kapitza, British-trained physicist who once worked in the Cavendish laboratories of the late Lord Rutherford at Cambridge (*See SNL,* July 23, p. 54).

For Kapitza has been in virtual retirement, not of his own choosing, living for the past two years or so in a country house not far from Moscow. He was neither banished to Siberia, as some rumors had it, nor did he disappear to play an important part in Soviet atomic energy research.

He has been in the Communist dog-house, but it was because his plans for tripling the production of steel in the USSR through use of liquid oxygen did not work out as promised, although they were partially successful.

Information is that Kapitza is actually back in Moscow working rather obscurely in a laboratory much less important than the one that he headed for years before and during the war.

Until the spring of 1935, Kapitza had been working in England at Cambridge on low-temperature problems. The Mond laboratory had been dedicated there in 1932 with powerful magnets that for a fraction of a second could produce a magnetic field more than a million times as great as the earth's magnetic field. Kapitza was using such apparatus in an attack on the secrets of the atom and physical laws.

He went back to Russia for what he thought to be just a visit. His passport was cancelled, and it was announced that he was "detained." The Soviet authorities wanted Kapitza's researches to be done at home.

So the British decided that it was better for the world to have Kapitza using the special equipment provided for him at Cambridge than to have Kapitza and the apparatus both idle and unused. So they sold the electromagnets and other equipment to the Russian government and they were moved to Moscow.

Interestingly, the money obtained was used to purchase for England its first cyclotron, which proved so important in atomic search.

Kapitza in his Moscow Institute for Physical Problems was fruitful. He did pioneering research on the very low temperatures near absolute zero where metals show little or no electrical resistance. He discovered that liquid helium, for instance, exhibits zero viscosity.

An outgrowth of this work was the invention by Kapitza of a turbine for production of oxygen at a low cost. It was reported to be a sixth of the size of conventional installations and it operated at four atmospheres instead of 200 atmospheres. It also began to produce oxygen very quickly and, combined with a nitrogen removal system, was suitable for the industrial production of oxygen. When a party of American scientists went to Russia just after the fall of Germany in 1945, Dr. Irving Langmuir, the General Electric chemist and Nobelist, learned from Kapitza that Soviet oxygen liquefaction units were supposed to produce oxygen at one-thirtieth the cost of the best units used by the Germans during the war in rocket fuel production.

The cheap oxygen was to be used in new methods of steel production in the Donbas and Soviet Asia and $2,000,000,000 were supposed to be spent on this gigantic project, financially of the order of the USA atomic bomb Manhattan project, which of course at that time the Soviet did not know.

Despite the fact that in 1945 200 tons of steel daily was reported being made in a pilot plant at Kapitza's institute, at a cost of about 25% to 30% that of ordinary blast furnaces, evidently the process did not work out as expected or something else happened. In any event, Kapitza lost face and his job. Toward the end of 1946 it was rumored that he had been sent to Siberia, presumably because he wasn't working on atomic energy.

Even if the rosy prospects of cheaper Soviet steel, thanks to Kapitza's oxygen, have not been completely fulfilled, oxygen is beginning to aid steel production in the United States, England and elsewhere.

Most immediate use of oxygen contemplated in the steel industry is in the open hearth process, the enriched air being blown in at the junction of the metal and the slag to speed the removal of the unwanted elements from the steel being manufactured.

Several steel companies have pilot plants based on this process in actual operation, but none of them are going all out for the use of large amounts of oxygen in steel production, so far as can be learned. Oxygen can also be applied to the electric furnace, to steel-making converters and to a lesser extent the blast furnaces that produce pig iron primarily.

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ENGINEERING

Playgrounds with Rubber Surfaces Are Under Trial

➤ PLAYGROUND children may soon be bouncing around on a rubber surface, saving shoe leather, clothing and the danger of skinned arms, legs and faces. A test in-

RUBBER-SURFACED PLAYGROUND—Ground-up rubber was mixed in asphalt for this test-installation of a new surface. It will mean a saving in shoe leather and clothing and will prevent skinned arms, legs and faces in accidental falls.

stallation of a rubber-surfaced playground is now on trial in Akron, Ohio, at one of the city schools.

In this new surface, ground-up rubber replaces the conventional crushed slag in an asphalt mixture. Crushed stone is used as a foundation. Over this is spread a "hot-mix" asphalt. This base is then covered with a half-inch of ground rubber, which is rolled to impregnate the rubber particles into the asphalt.

The material is somewhat similar to that used on the so-called rubber roads installed in the Netherlands before the war, and later in England. Five test sections of such roads are now being laid in the United States. There is an important difference: the playground surface is entirely free of abrasive particles.

The rubber-surfaced playground installation was made by the Portage Bituminous Company. Goodyear Tire and Rubber Company supplied the rubber.

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PSYCHIATRY

Hormone for Mental Ill?

➤ PATIENTS with the serious mental disease, schizophrenia, may at some time in the future be among those who will benefit from the present search for new sources of cortisone, powerful new weapon against arthritis and rheumatic fever.

Latest search for bigger sources of this chemical include a U. S. Public Health Service-Department of Agriculture expedition to Switzerland and Africa to look into plant sources of a starting chemical for manufacture of cortisone.

Because the supply of cortisone is so very small at present, it undoubtedly will be a long time before schizophrenic patients generally will be treated with it. And it may not prove successful in this disease.

But the outer rind, or cortex, of the adrenal glands which is the body's normal source of the hormone is known to be involved in schizophrenia. The part of the body-mind mechanism which fails under stress, resulting in schizophrenia, is the mechanism whereby the adrenal gland cortex normally responds to stimulation by a hormone from the pituitary gland in the head. In schizophrenia this mechanism goes wrong and the adrenal cortex fails to respond. Drs. Hudson Hoagland and Gregory Pincus of the Worcester, Mass., Foundation for Experimental Biology have discovered.

They discovered this by giving injections of the pituitary gland hormone, called ACTH, to schizophrenic patients, normal persons and patients with less serious mental illness termed psychoneurosis. The schizophrenic patients did not respond to the pituitary hormone until they had been given three and four times the amount that brought response in normal and psychoneurotic persons.

Cortisone itself may or may not be effective in schizophrenia. But when larger supplies of it and other, related chemicals are available, the problem of this widespread mental disease may be much nearer to solution.

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ASTRONOMY

Pole Star Is "Temporary"

➤ POLARIS, our pole star, is only a "temporary" occupant of that position.

We call Polaris, or alpha Ursae Minoris, the pole star because the northern end of the earth's axis happens to point nearly towards it. But the earth's axis "wobbles" so that other stars have been and will be pole stars.

About 5000 years ago when the pyramids were built in Egypt, Thuban, a star in the constellation of Draco, the dragon, was the pole star.

Around the year 13,000 A. D., our pole star will be Vega, in the constellation of Lyra, the lyre.

The movement of the earth's axis, called "the precession of the equinoxes," takes about 25,800 years to trace out a circle. Polaris at present is about a degree away from the exact line of the axis, but is getting closer to it all the time. About the middle of the next century, it will be nearest, and then it will move out of line again.

We think of Polaris as a single star, but actually it is a small stellar family. To the naked eye, it is seen as one star. Through a good telescope, a faint companion star is seen, and the brighter one is revealed as a triple star.

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AERONAUTICS

All-Metal Planes Safe From Lightning Strokes

➤ LIGHTNING strokes are practically harmless to flying airplanes with all-metal "skins", while wooden or plastic planes might suffer damage by lightning penetrating the outside covering to reach engines and metal parts within, the American Institute of Electrical Engineers was told in San Francisco by Julius H. Hagenguth of General Electric.

The G. E. scientist is engineer in charge of the company's High Voltage Engineering Laboratory at Pittsfield, Mass., and he described results of experiments on lightning stroke damage to aircraft conducted through several years in collaboration with the National Advisory Committee for Aeronautics.

Lightning is not a serious hazard to properly protected planes, he indicated, but non-metallic planes, unless well shielded with a network of wires or other protective coating, are subject to damage from even minor lightning strokes of the order of 20,000 amperes, which may make the plane inoperable, he said.

Subjects investigated during the study were listed as the burning of holes in the skin and metallic parts of planes, damage to fuel tanks, breaking of safety glass in windshields, effect of current flow through ball bearings of the control systems, effect of lightning on the pilot's vision and other possible damages.

The principal effect to a metal plane's skin from a continuous stroke was found to be a small hole burned in the metal. Although the type of metal appears to have little influence on the effect, he said, the holes differ in physical appearance.

Concerning effects of lightning flashes on the vision of a pilot, he stated that the pilot must be looking at the exact channel of the stroke to be affected at all, and the probability of such an occurrence is very small. He reported on the results of an investigation with artificial lightning on observers' eyes protected with special goggles. From 29 to 47 seconds were required before sight was restored to the protected eyes. For others a longer time might be required. But, he added, the threat of blindness is not enough to advise pilots to wear goggles.

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BIOCHEMISTRY

New Chemical Weapon Tested Against Cancer

➤ A LONG-NAME chemical which has produced small but useful improvement in some cases of cancer was described to the First International Congress of Biochemistry held in Cambridge, England, by Prof. J. S. Mitchell of Cambridge University.

The chemical—tetrasodium 2-methyl 1,4-naphthohydroquinone diphosphate—was injected in large doses into the veins and muscles of 240 patients with various types of advanced malignant tumors. Some of the patients also received relieving doses of X-rays, but regression and degeneration in one type of cancer cells, adenocarcinoma, was produced using the chemical alone. Prof. Mitchell said that the chemical has low toxicity.

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MEDICINE

Hayfever Has Increased

Estimates point to over 4,000,000 victims of the disease at present. "Shots" of the pollen are the best means for controlling the hayfever.

➤ HAYFEVER sufferers have more company in their misery now than they did some years ago. The a-choo ailment is "definitely a disease of civilization" and during recent years there has been an increase in cases of hayfever and other allergies, specialists agree.

A conservative estimate by authorities places the number of pollen hayfever victims in the United States now at three per cent of the entire population, or considerably over 4,000,000 persons, says Dr. Fred Wittich, secretary of the American College of Allergists.

The hayfever victim's best hope for effective control of his disease lies in proper methods of immunization, or desensitization as it is sometimes called. This consists in regular "shots" of gradually increasing doses of the pollens that cause his trouble. Specialists say these should be given months before the hayfever season starts, so that the patient gets well immunized or desensitized by the time he is exposed to quantities of the pollens in the air. But for those who do not get started early, "shots" during the hayfever season offer some help.

Results of immunization give greater relief, Dr. Wittich says, when the new hayfever drugs, antihistamines and epinephrin-like substances, are uesd during the hayfever season. These newer drugs do not keep the pollens from entering the nose, however, so if the patient is not receiving protection through immunization, the "shock" organ may change from the nose to lower in the breathing tract and cause asthma.

The most beneficial results are obtained when these new drugs are used in conjunction with immunization measures for preventing reactions from the immunizations. Used in this way, the drugs permit increasing the maximum dose of pollen extract above that which the patient can stand when pollen extracts are given alone.

The drugs must be suited to the individual case, however. As Dr. Harry Bernton, allergy specialist of Washington, puts it, "It's anyone's guess what any one drug will do for any one patient."

Reasons given by authorities for the increase in number of hayfever victims in recent years are: 1. More people and more physicians are becoming allergy conscious. 2. Plant vegetation has increased, particularly in the case of weeds such as ragweed which thrive on land turned over in road building and other projects. (This in spite of attempts by many communities to wipe out weeds, because eradication of any plant species is considered almost impossible.) 3. More people are moving about, migrating to the suburbs, or travelling about the country. 4. The tensions of our way of life probably play a part in the increase in allergies in general.

This last is an important factor, in Dr. Bernton's opinion. He thinks it is why he is seeing hayfever and asthma in young children with no family history of allergy, which is usually a familial or hereditary condition.

Dr. Bernton is considering a study of allergies in displaced persons in Europe, to see whether there is a relation between allergic diseases and emotional and nervous tensions.

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METEOROLOGY

Device Gets Cloud Data

➤ THE height of the base of a cloud above the earth has long been measurable, but a new instrument revealed by General Electric gives the height of the cloud at its summit as well as at its base, and it also indicates the density of the cloud.

The instrument, called a cloud analyzer, is designed to be carried aloft by a weather balloon which climbs into the upper atmosphere at a speed of about 1,200 feet per minute. It carries its own tiny radio transmitter, and sends data to the ground receiver at a rate of 120 times a minute. The balloon carries other instruments to provide data on temperature, air pressure and humidity.

The heart of the new instrument is a piece of string, saturated with a salt solution, through which an electric current is passed. Resistance readings indicate the liquid water content of the cloud. In passing through a cloud, the string picks up moisture and becomes a better conductor of electricity. A low resistance indicates water or rain. An increase in resistance indicates a decrease in the amount of liquid water in the air.

The balloon used climbs to about 75,000 feet, where it bursts because of the greatly decreased atmospheric pressure. The instruments in it are lowered safely to the ground by tiny parachutes. Even if lost, their readings are safe because they have been made a permanent record by the ground receivers in operation during the balloon's flight.

ANALYZING CLOUDS—A weather balloon, which will radio data 120 times per minute to the ground equipment, is being automatically tracked by this antenna. The airborne equipment will reveal the thickness, height, and density of clouds.

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MEDICINE

Jaundice Acquired on Job Is Granted Compensation

➤ COMPENSATION has been granted for the first time for the contraction of jaundice which developed from the prick of a needle used in withdrawing an infected donor's blood. This has opened the way to a new compensable occupational hazard, four New York doctors declared.

Compensation was awarded a woman blood bank worker who got jaundice by accidentally pricking her hand and fingers with the needles used in withdrawing blood from donors. Drs. Sidney Leibowitz, Louis Greenwald, Ira Cohen, and Joseph Litwins of Beth Israel Hospital reported in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 27).

The danger of transmitting the virus causing jaundice via the blood of donor to patient has previously been recognized, they pointed out. But infection in nurses, doctors and technicians performing this operation has been rare.

This case is important in two respects. It serves as a warning to medical personnel of the danger of accidental self-inoculation and is the first known case to get compensation for contracting the disease.

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AGRICULTURE

World Food Fund Proposed At UNSCCUR Conference

➤ A WORLD Food Fund, to be established by the member countries of the United Nations, was proposed by Sir Herbert Broadley, K.B.E., deputy director-general of F. A. O., at the United Nations Scientific Conference on the Conservation and Utilization of Resources, Lake Success, N. Y.

This fund, Sir Herbert explained, would not be expected to provide capital for a world program of increased food production; neither would it be called on to finance commercial transactions in the commodity field. Its purpose would be to "provide the resources for accurately measuring the possibilities, organizing the necessary research, planning the strategy of the international food campaign, and training those upon whom will fall the responsibility of directing the tactical operations of that campaign."

The world's increased food needs are measurable in almost astronomic figures, the speaker pointed out. To lift the curse of chronic hunger from the planet's increasing population, there must be by 1960 an annual production of 60,000,000 tons of cereals more than in prewar years, of 30,000,000 more tons of meat, of 250,000,000 more tons of fruit and vegetables, and of 35,000,000,000 more gallons of milk.

To meet these stupendous needs it will be necessary to use every possible means of encouraging greater production, Sir Herbert declared. More efficient use of lands now under cultivation, restoration of worn-out and abandoned soils through soil-conservation practices and irrigation, opening up of new lands, and improved transportation and distribution of products are among the things that must be done. Beginnings have been made, but they are only beginnings, he insisted. The cooperation of all peoples is necessary if chronic hunger is to be banished from the world.

Science News Letter, September 3, 1949

CHEMISTRY

Chocolate for Candy Now Made by One-Step Process

➤ CHOCOLATE for candy bars and other confections can now be made by modern scientific methods instead of by the usual rule-of-the-thumb method.

A one-step process of chocolate making, recently patented, is reported to give a much finer, tastier confection than heretofore obtained.

This new method will also allow a small manufacturer to go into the chocolate-making business with comparatively little capital and with a greatly reduced labor force, explains Justin J. Alikonis of the Paul F. Beich Company, Bloomington, Ill.

Basis of the one-step process is simultaneous air flotation of cocoa nibs and milk, powder, salt and other dry ingredients. Nibs are the chocolate particles obtained when cocoa beans are roasted and cracked open.

Temperature is kept below the melting point of the cocoa butter in the chocolate nibs. The nibs are roasted to the desired moisture content and cooled before being mixed with other ingredients.

Candy manufacturers, declares Mr. Alikonis, can save power, repair and maintenance costs and reduce their labor force as well as improve product quality using the new method.

Science News Letter, September 3, 1949

MEDICINE

Undercooked Polar Bear Meat May Transmit Disease

➤ LATEST health tip to vacationers in the very far north is to beware of undercooked polar bear and walrus meat. They might get trichinosis from it, warns the American Veterinary Medical Association in Chicago.

More usual source of trichinosis is undercooked pork that has the wormy germs, called trichinae, in it.

The disease hit 15 men on an expedition when they sampled raw or rare polar bear steak, one veterinary medical journal reports. And Eskimos are reported to have contracted the disease from eating walrus meat.

Science News Letter, September 3, 1949

NUTRITION

Freezing Will Not Make Those Steaks Tenderer

➤ THE notion that freezing meat will make it more tender is false, according to research findings at Cornell University. While there's an even chance of the meat becoming slightly more tender or slightly tougher, the difference either way is slight.

Neither does rate of freezing make much difference. There was more variation in tenderness between steaks cut from different carcasses than between steaks frozen at different rates.

The preliminary work also indicated that neither freezing nor rate of freezing has much effect on vitamin B content. After six months of storage, however, riboflavin content decreased markedly, while pantothenic acid and pyridoxine decreased slightly but consistently during that period.

"A turnover of all foods in the freezer at least once a year should result in little if any vitamin loss in freezer stored foods," said Prof. J. J. Wanderstock.

Other results show that storage temperatures must not be allowed to fluctuate above zero if the eating qualities and nutritive values of frozen foods are to remain constant. Pork, for example, easily becomes rancid under such conditions even after as short a period as four months.

Science News Letter, September 3, 1949

IN SCIEN

MEDICINE

Penicillin Fails as Cold Preventive in Trials

➤ HOPE that daily prophylactic doses of penicillin would keep people from catching colds and other respiratory ailments and losing time from work on account of such illness can be given up in the light of a report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 27).

The report is by Drs. Clifford Kuh and Morris F. Collen of the Permanente Hospitals at Oakland, Calif. These hospitals are part of the Permanente Health Plan established by Henry Kaiser early in the war for workers in his shipyards and their families.

Large-scale trial of daily penicillin doses as prophylaxis against nose, throat and similar illnesses was carried out for one year among members of the Permanente Health Plan who volunteered to take part in the trial.

The results of this trial were negative, Drs. Kuh and Collen report. Of the 2,937 volunteers, 1,486 were given twice-daily doses of penicillin pills. The other 1,451 were given pills of a harmless chalk mixture (calcium carbonate). Records at the end of the period showed practically no difference between the two groups in amount of respiratory or other illness, days lost from work or regular activities, days in hospital or number of persons who sought medical attention.

None of the volunteers knew which kind of pills they were getting. They were given a month's supply of pills at a time, and had to report in person to the hospital for the next month's supply. At the time of each monthly report, information was obtained as to whether they had been sick, what illness they had had, whether they had lost time from work on account of it and whether they had been in the hospital for any illness. Many of the original group dropped out in the course of the year, but several hundred carried through for the entire period.

Many relatively mild reactions to penicillin and also to the chalk pills were reported but there were no disastrous toxic effects from the long-continued taking of the penicillin. Neither was there any evidence that the prophylactic doses of penicillin kept it from being effective when it had to be given in remedial doses for illness.

The 730,000 penicillin tablets needed for this large-scale trial, worth over $100,000 at the minimum prevailing rates at the time, were supplied by the Lederle Laboratory Division of the American Cyanamid Company.

Science News Letter, September 3, 1949

...NCE FIELDS

ANTHROPOLOGY

New Human Fossil Found In South African Cave

➤ ANOTHER very early human type has been discovered in South Africa, source of many new human and near-human fossils in recent years. This newest find, which is more nearly human than some of the others, was made in the same cave that a short time ago yielded the jaws of a huge ape-man that was given the name *Paranthropus crassidens.*

The new fossil consists only of a lower jawbone, in which five molar teeth are still fixed, with the sockets of other teeth well preserved. It was found by J. T. Robinson, and is reported in the scientific journal, NATURE (Aug. 20), published in London, by him, together with Dr. Robert Broom. Both researchers are on the staff of the Transvaal Museum in Pretoria. They have given their new type the name, *Telanthropus capensis.*

The Telanthropus jaw is described as of ordinary human size—no larger or more massive than many modern jawbones. The two wisdom-teeth, however, are larger than any known similar modern tooth. While it is primitive in many respects, it is quite definitely human. Nearest resemblance is to the lone, and still puzzling, Heidelberg jaw, found in Germany many years ago. Like Heidelberg Man, Telanthropus was rather lacking in chin.

Site of the discovery, and poverty of the adjacent area in datable fossils of other animals, leaves the age of the new type in some doubt. Early pleistocene Ice Age seems likeliest.

Science News Letter, September 3, 1949

PSYCHOLOGY

Approval Necessary To Adolescent

➤ TO the boy of 12 years, the approval of others and having people look up to him is much more important than it is later when he is grown. Despite popular opinion that pictures the young boy as brutally indifferent to the feelings of others, the adult is no more interested in seeing other people happy than is the 12-year-old.

These are conclusions based on a study of the change of interests with age reported by the educational psychologist, Dr. E. L. Thorndike, of New York, to the JOURNAL OF APPLIED PSYCHOLOGY. Dr. Thorndike asked 37 graduate students of education to rate themselves on certain interests as they are now at the age of about 30 and as they were at the age of 12.

The boy is more interested in studying things, it was disclosed; the adult more interested in studying people and abstractions.

It is much more important to the boy to be among his own crowd.

Despite the changes with age, the boy's nature at 12 is prophetic of the kind of man he will become. The child to whom approval is more important than being boss is likely to grow up to be a man who seeks applause rather than power.

Science News Letter, September 3, 1949

GENERAL SCIENCE

Now It's HCSB: High Cost Of Scientific Books

➤ ADD HCL problems: the cost of scientific books.

They now cost so much that "it is virtually impossible for many scientific workers to own volumes they need and this is to say nothing of the poor student, who has to struggle to pay for texts that are absolutely essential," complains a communication to the journal, SCIENCE (April 22).

The protest against book costs by John R. Lowry of General Foods Corporation, Hoboken, N. J., appears in the journal's annual book issue.

"I see no reason for paying $4.00 for a 147-page book—the price asked for a recent publication," he comments.

Mr. Lowry's solution: use the European procedure of issuing books unbound as well as bound. This would cut the price of many books by a fourth, he contends.

Science News Letter, September 3, 1949

AGRICULTURE-ENTOMOLOGY

If Carrot Seeds Fail, Blame Bad Lygus Bugs

➤ IF LESS than half of your carrot seeds sprout, blame it on the Lygus bugs. Evidence that these inconspicuous, "average-looking", quarter-inch-long insects are to blame for wholesale failure of seeds of the carrot family to germinate and produce new plants is presented in the journal, SCIENCE (April 8), by Florence Flemion of the Boyce Thompson Institute for Plant Research in Yonkers, N. Y.

Seed-producing plants of carrot and dill were placed in insect-tight cages, and various kinds of insects were caged with them. The plants with which Lygus bugs were caged produced very high percentages of seed without embryos, hence incapable of sprouting. Those caged with other kinds of insects, but with Lygus bugs excluded, produced full crops of normal seed, complete with embryos.

Although only carrot and dill were used in Miss Flemion's experiments, there is reason to believe that the results hold good for other members of the family as well—parsnip, parsley, caraway, coriander, fennel and several other flavoring herbs.

Science News Letter, September 3, 1949

GENERAL SCIENCE

Truman Asked To Appoint Group To Study Security

➤ PRESIDENT Truman is asked to appoint a commission on science and national security in a letter from 145 scientists published in the journal SCIENCE (Aug. 26).

A full investigation is suggested for "excessive attempts at secrecy" that may "diminish instead of preserve our national security."

Other questions that the proposed group of leaders from various fields of science, education, government and business would consider include:

Should secret research be conducted outside military establishments?

What clearances of scientists "admissible within the bounds of scientific and democratic tradition" should be required in military, other government and non-governmental laboratories?

If political tests for non-secret scientific work are required, what effect would there be on the morale of scientists and scientific progress?

The dilemma, the letter says, is that the narrowest interpretation of military security demands that nothing be revealed that might conceivably be useful to a potential enemy, while experience shows that withholding knowledge and abridgment of freedom of thought rapidly inhibit research.

Science News Letter, September 3, 1949

MINERALOGY

Low-Grade Ores Yield Gold By Magnetic Method

➤ GOLD and silver can be pulled out of hitherto unworkable low-grade ores by means of invisible iron handles, in a process on which U. S. patent 2,479,930 has just been granted to Earl C. Herkenhoff and Norman Hedley of Stamford, Conn., assignors to the American Cyanamid Company.

Concentration of practically all precious metals out of their ores begins with getting them into a cyanide solution. This is followed, in the case of high-grade ores, with precipitation on finely divided zinc. With some low-grade ores, finely divided activated carbon is used instead, followed in turn by a flotation treatment. Flotation is troublesome, however, and appreciable losses are entailed.

Messrs. Herkenhoff and Hedley obviate this handicap by rendering their carbon magnetic, either through the incorporation of ground magnetite or by impregnation with an iron salt which is subsequently reduced, leaving pure iron in the pores. After the carbon has adsorbed the dissolved gold, it is separated out by familiar commercial magnetic means. Much larger carbon particles can be used with corresponding reductions in losses.

Science News Letter, September 3, 1949

VETERINARY MEDICINE

World Attack on Animal Ills

International cooperation in fighting animal diseases is saving meat, milk, and eggs for a hungry world. It is also protecting human health.

By DR. FRANK THONE

➤ BECAUSE American stockmen dreaded a cattle plague with a Boer-Dutch name, fewer Chinese peasants will lack rice. Because hens sickened and died in an English town famous since the Middle Ages, there will be more eggs in Argentina.

Because Czech farmers were horrified at the rate they were losing pigs, a new lead toward the conquest of poliomyelitis may be opened up.

Less widely heralded than medical men's researches on the ills that afflict human beings, veterinary research is of vast importance to mankind as well. Animals mean meat and milk, shoes and saddles, and (for all our motor age) a great deal of transportation and farm power. Some of the diseases they have are transferable to man: rabies, anthrax, brucellosis—a whole array of perils to human health. So government departments and international organizations are well advised when they devote much effort and generous funds to the discovery of causes and cures for the ills of animals.

Cattle Plague

Take that cattle plague with the Boer-Dutch name, for example. During the war there was a report that an enemy nation was preparing to initiate biological warfare by launching an infection of rinderpest among our Western cattle herds. In anticipation of this thrust (which was never delivered) our own veterinary researchers made ready their parry, in the form of an effective vaccine.

Rinderpest, translated from its Afrikaans original, means "cattle pest." It is exactly that. It is a deadly disease of all kinds of cattle, including the Asiatic water-buffalo, that kills nine-tenths of all the animals it attacks. It was first known in South Africa, whence its name. Unknown as yet in the Americas, it has been found to exist in practically all parts of Africa and Asia.

It is endemic in Ethiopia and the Sudan, which are great grazing areas and could become great meat-exporting countries, if the curse of this dreaded infection were not on their beeves. The peoples of this huge sector of Africa can become much more prosperous than they are, once practical means for protecting their herds, already available, can be applied.

Rinderpest cuts even closer to the basis of human life in rice-eating China. Few Chinese eat beef or drink milk, yet one kind of cattle are absolutely essential to life in China. Chinese farmers use buffalo as their plow animals. If a man has a buffalo or can hire one during the planting season, he makes a good crop of rice and his family has food for the year. If the buffalo dies of rinderpest, all the field labor has to be done by hand— and human muscles are simply not adequate for the task. So there is a short crop, with famine afterwards.

Rinderpest outbreaks are frequent in rice-eating China. And where these cattle die, the human population dependent on their slow, patient, grunting toil is not long in following them.

The wartime development of a protective vaccine was a joint project of the United States and Canada, carried on in a carefully isolated laboratory on an island in the St. Lawrence river. The big advance in technique was the growth of the vaccine in incubated eggs, instead of the bulkier, slower, costlier job of producing it in the bodies of animals. At the end of the war, since the vaccine was no longer needed for possible defense purposes, the laboratory was closed down.

However, realizing the immense potential value of the vaccine in lands where rinderpest already existed, the job was taken over first by UNRRA, then by FAO—Food and Agriculture Organization of the United Nations. Their technicians helped the Chinese to produce the vaccine, and in the even more difficult task of inducing the Chinese farmers to bring around their draft cattle to receive this life-saving protection. While the recent course of the civil war in China has interfered with this work, there is no question about its being resumed and pushed further as soon as things become stabilized there.

Protecting Milk

Another example of the great benefits of international cooperation in bettering food supplies through safeguarding the health of cattle is the case of bovine mastitis. This is a "strep" infection of cows' udders, which cuts milk production, shortens animals' lives, and affects human health directly through the causing of certain maladies such as one type of "strep" sore throat. Mastitis is fought not with a vaccine but with penicillin, which is produced in a form suitable for veterinary use. It has been estimated that this treatment is capable of increasing milk production in Europe alone by more

CATTLE PROTECTED AGAINST DISEASE—At a field vaccinating station in China patient, slow-paced plow-buffalos line up for the "shots" that will protect them from rinderpest.

IMMUNIZING CHICKENS—A Chinese farm wife holds a frightened hen while the veterinarian inoculates it against one of the worst known enemies of chickens, Newcastle disease.

than 5,000,000 tons a year.

Foot-and-mouth disease affords still another example of the value of international cooperation in fighting animal ills. Prevalent in Europe and South America, this debilitating infection of cattle was kept off the North American continent until recently, when it became established in central Mexico. Naturally, cattle interests in the United States have become very much alarmed.

Kill-And-Bury Method

When it became evident that the complete kill-and-bury method of suppressing the disease, successfully used against two or three outbreaks on American soil, was not going to work under the quite different conditions obtaining in Mexico, the fighting forces fell back on the vaccination method. This time it is a Swiss vaccine, improved by American and Mexican scientists, that is being injected into the cattle south of the Rio Grande.

Brucellosis is a disease complex that afflicts both domestic animals and human beings, so the international attack on it is being conducted on both the veterinary and the medical fronts. It gets its name from that of the causal germ, known to bacteriologists as Brucella. This is an exceedingly small organism, barely visible under the highest powers of the microscope; it is intermediate in size between "regular" bacteria and the microscopically invisible viruses. Among animals, brucellosis is widely known as contagious abortion, from one of its commonest and costliest manifestations. In human beings, whom it "drags down" but seldom kills, brucellosis is called Malta fever and undulant fever. Brucellosis is being fought in both animals and man with vaccines and antibiotic drugs.

Newcastle disease, so called because it was first detected in Newcastle, England, is one of the worst of known enemies of chickens. It is present in practically all parts of the world, including the United States. Best known weapon against it is a vaccine; American workers have developed a new and reportedly highly effective one, which is being used in other lands by FAO workers.

Swine Disease

One of the strangest yet most encouraging stories of this veterinarians' war for the saving of human lives comes from iron-curtained Czechoslovakia. Pigs were dying by the tens of thousands in the province of Teschen, from an apparently new virus malady. It was accordingly given the name, Teschen disease. Czechoslovakian scientists are working on a preventive virus, but in the meantime the only practical means of checking its spread is ruthless liquidation of all herds of swine in which it appears.

What should interest medical men most, however, is the strange similarity between Teschen disease and human poliomyelitis. Both are virus-caused. Both bring about a muscular paralysis. Of course, afflicted pigs die; for them there are no iron lungs. But in dying they may be able to give some information about the nature and course of human poliomyelitis, hitherto unobtainable because of the lack of suitable experimental animals on which to conduct tests.

Dr. K. V. L. Kesteven, FAO adviser on animal diseases, believes that if the problem of Teschen disease can be solved, conquest of polio will be speeded. To Czech farmers losing pigs this may be scant consolation. But it may eventually save the lives of many little children.

Science News Letter, September 3, 1949

CHEMISTRY

Gammexane Smoke Found Not So Good for Paper

➤ SMOKE of Gammexane, or benzene hexachloride, one of the more promising of the new synthetic insecticides, isn't good for paper, S. Chakravorti of the research laboratory of the National Archives of India states in the journal, NATURE (April 16).

Its use was proposed as a means of getting rid of insects that infest places where valuable papers and books are kept, and that sometimes do a good deal of damage to important records. However, because nothing was known about its effects on the paper itself, Mr. Chakravorti decided it would be wise to make some tests before putting it into general use. It turned out to be a wise precaution.

Two-ounce Gammexane smoke generators were used in closed rooms where paper samples were exposed. After three days the samples were tested, and were found to have lost from one-half to nearly three-fourths of their tensile strength and resistance to breaking on being folded repeatedly.

Some of the samples were artificially aged by heating for three days at boiling temperature. Most of them yellowed, and practically all of them became less resistant to folding. One especially fine all-rag paper, used in repairing ancient manuscripts, and normally able to withstand more than 4,000 foldings before breaking, after the Gammexane-plus-aging treatment, broke the first time it was folded.

Science News Letter, September 3, 1949

POPULATION

Fewer Males Predicted

➤ THE sex ratio in the United States population in 1975 will be about 985 males per 1,000 females, statisticians of the Metropolitan Life Insurance Company predict.

This means a slight decrease in males below the 1947 figure when for the first time in our history there were fewer males than females in the population. The ratio then was 992 males per 1,000 females, with men in the armed forces overseas counted in.

The sex ratio at ages 15 to 44 years, however, is expected to reverse its downward trend and eventually will lead to a surplus of males under middle age. This expectation is based on gains in life conservation. At ages under 15, the ratio of boys to girls has increased from 1,022 per 1,000 in 1910 to 1,037 per 1,000 in 1947. This ratio may increase further as mortality in childhood continues to decline.

At the early years of life, the statisticians point out, there is always a surplus of males because more boys are born than girls. The excess of males is reduced with advance in age because of the higher death rate for males.

This was offset in the United States during the early years of the century by the high influx of immigrants in which men greatly outnumbered the women. In 1910 there were 1,060 males for every 1,000 females in our population, and even as late as 1940 the ratio was 1,007 per 1,000. The ratio will continue to decline at ages 45 and over, the statisticians state, as the foreign-born population with its excess of males passes out of the picture.

Science News Letter, September 3, 1949

MEDICINE

Fluorescent Lights Harm

➤ WORKING near unshielded fluorescent lights can produce a sunburn-like effect on the skin, Dr. R. Ralph Bresler, chairman of the Industrial Health Section of the Philadelphia County Medical Society reported.

This discovery followed the complaint of five women who were employed in a small penicillin filling-room. The skin of their arms and neck not covered by clothing was red, dry and itched. Tests eliminated skin sensitivity to the drug.

Ultraviolet lamps, which were used to sterilize the room, then fell under suspicion but investigation revealed that they were never turned on when the workers were in the room. Further checking at each worker's position showed that even with them turned on the shields were adequate protection.

The ozone emitted by the sterilizing lamps was also measured but found to be within safe limits so that there was no question of an ozone inhalation danger.

Attention was then focused on the ultraviolet lamps which illuminated the filling tables. It was discovered that when these women worked in another room where the filling tables were lighted by ordinary incandescent lamps, the skin inflammation disappeared.

Dr. Bresler, reporting to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 27) stated that since the lights were 10 to 14 inches from the workers, and since they were exposed to them for six to eight hours a day, it was entirely possible to get the skin burn found in these patients.

Two other patients had been previously reported as suffering from a skin inflammation when fluorescent lighting had been introduced into their office. These are the only cases on record.

Dr. Bresler pointed out that of three possible remedies, the most practical and safe was found to be the placing of an all-around plate-glass shield around the fluorescent fixtures to absorb the radiation without cutting down the light.

The other two protective measures, replacing fluorescent lighting with incandescent lighting or the using of protective ointments or creams, were found undesirable and impractical.

Science News Letter, September 3, 1949

ENGINEERING

Lightweight Tractor Built for Small Farms

➤ A LIGHTWEIGHT tractor for small acreage farms which is capable of flexing its muscles like a heavyweight when the going gets rough has been developed at England's National Institute of Agricultural Engineering.

The mighty midget was described in a paper submitted by S. J. Wright of the Ford Motor Company, Ltd., Dagenham, England, at a land section meeting of the United Nations Scientific Conference on the Conservation and Utilization of Resources at Lake Success, N. Y. The tractor is a standard two-wheeled machine. Its unique feature is a winch mounted in front with a clutch and chain drive from the engine.

On its ordinary power it performs routine tasks. When a job requires extra power—for example, deep furrow plowing— the winch attachment takes over. The free end of the cable is anchored at the far end of the field, the winch starts winding, and the tractor hauls itself across the field. When the plow is raised, the tractor runs in reverse gear to its starting point and the operation is repeated. As many as seven or eight furrows may be plowed in this way before the anchorage needs to be reset. The winch carries about 100 yards of cable.

While quite unsuitable for large scale operations such as are required in the middle west or in the areas where large stumps or other heavy obstacles might be encountered, American experts think it might be adapted successfully to certain sections of the United States, especially in the South and East.

Science News Letter, September 3, 1949

RADIO

Voice of America Jammed By 205 Soviet Stations

➤ THE Soviet Union made use of 205 separate jamming stations to keep the radio Voice of America and other foreign broadcasts from reaching its population, the U. S. Department of State says in a recent issue of its monthly Information Sheet. These 205 jamming stations were noted by a British monitoring station in the United Kingdom late in May.

United States Government monitors report that there has been no considerable change in Soviet broadcasting schedules for its own people, indicating that the jamming is carried out by a separate set of high powered transmitters not employed for ordinary programs.

The Voice of America broadcasts had been jammed since February, 1948, but only on a limited and sporadic basis until April 24, 1949. Three agencies of the United States have accurately located the sources of this deliberate interference. All these sources are inside the Soviet Union. Approximately four times the number of transmitters are involved in the Russian jamming as are used by the United States Government in its entire world-wide international broadcasting program.

Jamming is a deliberate radio interference designed to make radio programs unintelligible. One system is to send out from transmitters radio signals of the same identical frequency or wave length as used by the incoming program. Another varies in the frequency of the jamming waves, varying from above to below those of the incoming waves. A third puts on the air "noises" from random frequency modulation.

Science News Letter, September 3, 1949

The so-called *Cleopatra's Needles* from Egypt, one now in England and one in the United States, were quarried from solid granite far up the Nile, some 1,500 years before Cleopatra's time.

NUTRITION

Milk as Sole Life Diet

➤ IT'S possible to support life from birth to death in old age on an exclusive diet of milk.

White rats lived to ages comparable to 70 and 90 years in humans with no food other than cow's milk, with a few necessary minerals added.

Dr. C. M. McCay of the New York Agricultural Experiment Station gave one group the milk diet and another received rations of cereals, meats, and other normal human foods over a two-year period. There was no apparent difference between the two groups, including length of time lived.

The erroneous idea that milk is food only for the young stems from the observation that young animals change from a milk diet to adult food when they get their teeth. Actually, says Dr. McCay, "I believe the young stop milk to permit the mother-animal to recover from the long drain upon her body in producing young and to prepare for the next cycle."

Milk is an excellent and nearly complete food at all stages of life, he said. It does lack trace elements, such as manganese, iron, and copper, but these are usually found in the solid food of the adult or can be added to a milk diet. The milk-fed rats in the tests never had any solid foods so never had a chance to chew during their lives.

Dr. McCay concluded from the experiments that "mineralized milk can serve as the sole article of diet from weaning until death in old age."

Science News Letter, September 3, 1949

ENGINEERING

Study Corrosion of Pipes

➤ THE usual cast-iron water pipes seem to resist corrosive action with cold water flowing through them about as well as the more expensive commercial pipes now available, the National Bureau of Standards concludes from a 10-year experiment.

The rapidity with which water pipes corrode, and fail, is important information to the home-owner and the building industry. The replacement of corroded pipe usually is an expensive job, often requiring the rebuilding of walls and flooring.

In the Bureau's investigation, tap water of the Washington system, which has a known analysis, was circulated at constant velocity through a system of eight vertical columns, each made up of 14 specimens of commercial pipe lengths. The specimens consisted of two types of cast iron, three of wrought iron, two of ingot iron and three of open-hearth steel. The amount of inside corrosion was determined by loss of weight and the depth of the pits in the materials.

Every precaution was taken in the investigation to assure reliable results. Except for the metal specimens, the water within the apparatus came in contact only with rubber, glass and stainless steel. Hard rubber rings separated the specimens to prevent metallic contact and galvanic action. The outside of the piping was coated with asphalt varnish to prevent outside corrosion and loss of weight.

Failure of any piping material in actual service usually results from perforation of the wall by pitting. The shallowest pits occurred in the centrifugally cast iron, while the sandcast iron had pits approximately twice as deep. The results of the tests indicate that there is no great difference in the rates of corrosion of most of the wrought iron materials when measured either by loss of weight or the depth of pitting.

A low-alloy steel had the highest corrosion rate, while a copper-molybdenum ingot iron and a nickel-bearing wrought iron had the lowest rates. Other low-alloy materials such as wrought irons, ingot iron, and ordinary medium carbon steel pipes corroded at intermediate rates. A rough estimate of the minimum life of these bare materials when subject to continuous flow of Washington (D. C.) water would be about 15 years on the basis of the work, the Bureau states.

The tests were made by G. A. Ellinger, L. J. Waldron and S. B. Marzolf of the Bureau staff.

Science News Letter, September 3, 1949

MEDICINE

Arc Welder's Light Can Produce a Sore on Mouth

➤ ATTENTION has been called to a new industrial hazard which produces a sore on the mouth of men coming in contact with arc welder's light by Dr. Sydney Vernon of New Brunswick, N. J.

He suggests that the sore might possibly be a precancerous lesion. His report on two patients appears in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 27).

One of the patients came in contact with arc welder's light while reading blueprints in a shipyard. His only protection consisted of goggles for the eyes while the welders had hoods protecting their heads. Examination showed a crust on his lower lip which was very pale and thickened. The sore was removed by surgery and the patient recovered without any after-effects.

The other patient had worked on and off in his father's welding shop for some ten years. At one time he had an operation for a "wartlike growth" on the lower lip. He complained of a sore near the same spot when seen by the physician. This was a constant source of irritation and made him bite his lip. The sore dried up with electrolysis but came back, so he was operated on with successful removal of the lesion.

Science News Letter, September 3, 1949

CHEMISTRY

Virginia Hospital Has New Oxygen-Making Plant

➤ THE largest oxygen manufacturing plant in any hospital and only the second of its kind has just been completed by the Medical College of Virginia at Richmond.

Oxygen generated by the new plant is piped to operating and other rooms where it is needed for patients. Top production is estimated at 500,000 cubic feet of oxygen per month, though the hospital averages only 150,000 to 200,000 cubic feet monthly.

Most hospitals obtain oxygen in cylinders, and large savings are expected from use of the new plant.

Memorial Hospital, Hartford, Conn., was the first hospital to install its own oxygen manufacturing unit.

Science News Letter, September 3, 1949

ZOOLOGY

NATURE RAMBLINGS
by Frank Thone

No Sea-Serpent?

➤ WHAT has become of the Sea-Serpent? Summer has passed, and we stand at the threshold of autumn, yet from no beach resort has come that most hardy perennial of all publicity stunts: the sighting (usually at dusk, or in a fog) of a giant serpentine form undulating in coils through the affrighted waves. Even the usually dependable Loch Ness monster seems to have gone into retirement.

Perhaps there is a tacit, unworded agreement that in these tense and unquiet times any extraneous promotion of mass jitters would be a work of supererogation. Or it may be that the drifting log or other imagination-arousing piece of flotsam is interpreted as a spying submarine instead of a mythical monster.

Romantic-minded persons who like to nurse the sea-serpent myth sometimes argue for a "lost world" in the depths of the ocean instead of on an isolated plateau in the tropical jungle. Why shouldn't some of the long-necked, long-tailed, paddle-limbed marine saurians of fifty or a hundred million years ago not have survived, they ask, safely hidden from prying human eyes save at the rare intervals when they come to the surface?

If these ancient marine reptiles had any physiological resemblance at all to modern members of their tribe, they could not have been dwellers of the depths. All reptiles are air-breathers, hence must get at least their noses above water quite frequently. The chances are that most of them swam with their heads above water the greater part of the time, submerging only when they were hunting food.

Moreover, all reptiles now living are cold-blooded animals, and it may be safely inferred that these ancient giants were cold-blooded, too. That must have limited their habitat to shoal waters or the warm surface of the open sea. At great depths the ocean water is icy cold, and may be safely invaded from above only by specially adapted warm-blooded animals like the whales. The larger aquatic reptiles, like the crocodilians and the giant sea turtles, habitually stay close to the surface, where they can soak up the warmth they need to remain alive and active.

Unless some unexplored bit of warm, shallow tropic sea can be found where survivors of the Jurassic or Cretaceous reptilian aristocracies may bask and feed and mate, it seems most unlikely that any sober seafarer or beach-comber will ever behold a living plesiosaur or mosasaur. And the South Seas have been rather thoroughly investigated, especially of recent years.

Science News Letter, September 3, 1949

CHEMISTRY-PHYSICS

No Long-Lived Astatine

➤ HOPE of finding a long-lived variety of the new radioactive element astatine has faded.

This news has been reported to scientists in the JOURNAL OF CHEMICAL PHYSICS by a team of University of California chemists, Drs. G. L. Johnson, R. F. Leininger and Emilio Segre.

Their scientific search was for a long-lived isotope of the element, No. 85 on the chemists' list. They discovered two previously unknown isotopes of astatine, but they did not find one with much life-expectancy. Their longest-lived one has a half-life of only a little more than eight hours. In all, seven varieties of astatine are now known.

In their researches, the University of California scientists had to use invisible amounts of astatine, because its short life prevents stockpiling. They got their samples of the element which does not occur in nature by bombarding bismuth with alpha particles in the 60-inch cyclotron at the Crocker Radiation Laboratory.

Like its close chemical relative, iodine, the new element dissolves in organic liquids. Carbon tetrachloride, the familiar cleaning fluid and fire extinguisher, was used to dissolve the minute amount of the element.

Although never seen by man, astatine is known to be more like a metal than the other members of its chemical family. Besides iodine, they are: chlorine, widely used as disinfectant and bleach; bromine, whose salts are used in photography; and fluorine, the exceedingly active gas whose large-scale production was a by-product of the wartime work on the atomic bomb.

Science News Letter, September 3, 1949

BIOCHEMISTRY

Cobalt Is Beneficial To Cattle and Sheep

➤ COBALT, a trace element needed by sheep and cattle, helps them indirectly by helping certain beneficial bacteria that live in their digestive tracts. Strong evidence to this effect has been produced in experiments reported in SCIENCE (May 6), by Dr. Lorraine S. Gall and associates, working at Cornell University and the Ohio Experiment Station.

Four groups of sheep were used in the experiments. The first was kept on a cobalt-deficient diet and given no cobalt. The second received the deficient diet and cobalt injections into their veins The third group got the same diet, plus cobalt by mouth. The fourth group received a normal diet (containing cobalt) but was kept on short rations. Samples from the rumen, or cud-pouch, in the first two groups contained only half as many bacteria as those from the last two, where cobalt was taken in with the feed. There were marked differences also in the bacterial forms present in the two sub-groups.

Associated with Dr. Gall in the research were Drs. S. E. Smith, D. E. Becker, C. N. Stark and J. K. Loosli.

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• Books of the Week •

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W. Washington 6, D. C. Ask for free publications direct from issuing organizations.

THE ANTHROPOLOGY OF IRAQ: Part I, Number 2: The Lower Euphrates-Tigris Region—Henry Field—*Field Museum of Natural History*, 426 p., illus., paper, $5.00. Report of an expedition which started in 1934. Almost 200 plates add to the value of this monograph.

BRITISH AGRICULTURAL BULLETIN, Vol. I, No. 3—*British Council*, 152 p., illus., paper, 5 shillings. ($1.00). Published quarterly and contains articles on leading subjects. For the Agricultural Scientist and the well-informed layman.

CAN LABOR AND MANAGEMENT WORK TOGETHER?—Osgood Nichols and T. R. Carskadon—*Public Affairs Committee*, 32 p., illus., paper, 20 cents. Pamphlet No. 151 is a brief discussion of this foremost problem.

GOETHE AND PHARMACY—George Urdang—*American Institute of the History of Pharmacy*, 76 p., illus., paper, $2.50. The institute's contribution to the 200th anniversary of the birth of the great poet and naturalist by the director of the institute. Traces the great poet's interest in pharmacy from the time of his early training in that science to late life.

GROUP MEDICINE & HEALTH INSURANCE IN ACTION—Robert E. Rothenberg, and Karl Pickard—*Crown*, 278 p., illus., $5.00. An account of actual experience in prepaid medicine and group medical practice, this book depicts the experience of a group of doctors who have been serving more than 14,000 people for two years.

THE HARVARD LIST OF BOOKS IN PSYCHOLOGY—Gordon W. Allport and others—*Harvard University Press*, 77 p., paper, $1.00. A list of 612 books which the members of the instructing staffs of the Departments of Psychology and Social Relations in Harvard consider important and valuable.

JORDAN-BURROWS TEXTBOOK OF BACTERIOLOGY—William Burrows—*Saunders*, 15th ed., 981 p., illus., $9.00. Revised and partially rewritten.

THE MAPLETON METEORITE—Sharat Kumar Roy—*Field Museum of Natural History*, 10 p., illus., paper, 40 cents. A general account of an iron meteorite found in a corn field in Mapleton, Iowa.

THE MIRACLE DRUGS—Boris Sokoloff—*Ziff-Davis*, 308 p., illus., $3.00. This book tells of the background to the new antibiotics and sulfonamides, among which are penicillin, streptomycin, neomycin, patulin and aureomycin, and gives the layman information on what the new drugs will do so far as scientists know today.

A NEW ANT-THRUSH FROM BRITISH GUIANA—Emmet R. Blake—*Chicago Natural History Museum*, 2 p., paper, ten cents.

ORGANIZATION OF THE AMERICAN EXPEDITIONARY FORCES—Vol. I: United States Army in the World War 1917-1919—Historical Division of the Department of the Army—*Gov't Printing Office*, 426 p., illus., $3.00. The first of a series of volumes to present a widely representative selection of the records believed to be essential to a critical study of the history of that war.

POLICY-FORMING DOCUMENTS AMERICAN EXPEDITIONARY FORCES—Vol. II: United States Army in the World War 1917-1919.—Historical Division of the Department of the Army—*Gov't Printing Office*, 650 p., illus., $4.00. Documents showing the development of policy at General Headquarters.

REHABILITATION OF THE HANDICAPPED: A Survey of Means and Methods—William H. Soden, Ed.—*Ronald*, 399 p., $5.00. Articles on medical rehabilitation by leaders in the different fields.

TV PICTURE PROJECTION & ENLARGEMENT—Allan Lytel—*Rider*, 179 p., illus., $3.30. This book with its numerous illustrations, and its well integrated subject matter will appeal to any one interested in television servicing.

THE USE OF "KIRKSITE" FOR METAL FORMING—John L. Young—*Mellon Institute*, 4 p., illus., paper, free upon request to Mellon Institute of Industrial Research, University of Pittsburgh, Pittsburgh 13, Pa.

THE VERTEBRATE BODY—Alfred Sherwood Romer—*Saunders*, 643 p., illus., $5.50. A college text with considerable paleontological background.

THE WORLD AS I SEE IT—Albert Einstein—*Philosophical Library*, Abridged Ed., 112 p., $2.75. A republication of Dr. Einstein's first general book. Excerpts are compiled of his articles, addresses, and pronouncements to show his thoughts on life, the world about him, and on his scientific labors.

Science News Letter, September 3, 1949

PSYCHOLOGY

Dogs Broadcast Reactions By Way of Radio Signals

➤ DOGS not only signal by wagging their tails at Jackson Laboratory but they broadcast to a scientific radio receiver their brain waves, blood pressure and other emotional reflexes.

The canine assistants to the scientists in Bar Harbor, Maine, wear a light-weight harness carrying a little telemetering instrument that broadcasts by low-powered shortwave radio the signals that are picked up by a special receiver that writes a record.

When the dog is made angry or afraid by meeting another dog or an unusual situation, the effects that this emotion produces can be investigated without tangling the animal in a maze of wires as older devices required. The animal, except for the radio pack he carries without trouble, is just as free and unencumbered as he would be frisking about at home.

Part of a program on animal psychology that is expected to help to throw light on why humans act the way they do, the new brain wave telemetering is being developed under the direction of Dr. J. P. Scott.

Science News Letter, September 3, 1949

Words in Science— SEED-SPORE

➤ SEEDS and spores both hold the promise of the coming generation of plant life, but they are quite different.

A seed contains within its hard coat the young embryo and material to support its life during the early days. It is formed by pollen and female plant organ in sexual union. Even the smallest seed contains many thousands of cells.

A spore contains no embryo. It is a single cell, formed by the cell division of a mother spore cell, which is capable of development into a new individual. It is usually asexual. Ferns, mosses, fungi and algae are among the plants reproduced through spores, not seeds.

Science News Letter, September 3, 1949

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N. St., Washington 6, D. C. and ask for Gadget Bulletin 481. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

SILICA COATING for the insides of incandescent electric light bulbs improves appearance and reduces glare without sacrificing light output. Very fine silica is used and it is applied by a special process.

Science News Letter, September 3, 1949

CONVEYOR for loading and unloading trucks, and for the handling of packages within a shop, is made in 10-foot sections of aluminum or magnesium with rollers of a long-wearing plastic. The 10-foot sections which have a load capacity of 500 pounds, weigh only 31 pounds. Sections can be hooked together in a series.

Science News Letter, September 3, 1949

RIBBON SOLDER, containing its own flux, is the width and thickness of ordinary binding tape and is featured by its low melting point. Heat can be applied to a bit of the material at a point to be soldered either with a common match or a soldering iron, resulting in a neat and strong joint.

Science News Letter, September 3, 1949

SAFETY POURING spout, for use with five-pint acid bottles or one-gallon jugs, has an ingenious design which vents air into the container as the liquid is poured out, thus eliminating splashing, spilling, and "after-drip." It is a simple device, as shown in the picture, and is made of a plastic resistant to most chemicals.

Science News Letter, September 3, 1949

ANTI-FRAY liquid, easily applied to frayable fabrics by brush before cutting, has an advantage over earlier preparations for the same purpose in that it is non-inflammable in the dried state, is fast-drying and neutral in color.

Science News Letter, September 3, 1949

TURN-TABLE for any table television set, which permits viewing from any position without shifting the furniture or lifting the receiver, glides on nickel-plated ball bearings and allows even heavy sets to be turned easily. The steel turn-table ring has a base of wood and felt that protects any table surface from damage.

Science News Letter, September 3, 1949

RADIATION COUNTER, for use in the nuclear field and in measuring radioactivity, combines the functions of a scaling unit, a radiation survey meter, a count rate meter and a contamination detector. The 24-pound portable instrument is about 12 by 10 by 8.5 inches in size.

Science News Letter, September 3, 1949

MAPS that graphically simulate the colors and contours of the earth as the terrain appears from high altitudes are now provided for passengers by one of the transcontinental airline companies. With them the traveling public can identify all major landmarks below.

Science News Letter, September 3, 1949

Do You Know?

The *average person*, it is said, breathes in a pint of water a day.

More than 4,500,000,000 pounds of *fish* were brought into United States ports during 1948.

Artificial heating is required about eight months each year for a large percentage of the homes in the United States and Canada.

Plastic films that can be peeled off easily have been found useful as a primary barrier to protect permanent coatings and base materials from radioactivity.

The *daily requirement* of the average normal man is 3.5 pounds of food, four pounds of water and 34 pounds of air, a scientist recently stated.

Of the three principal *components of food*, carbohydrates are abundant; fats, while not present in large quantities, are still fairly plentiful; but the supply of protein is strictly limited.